

ABSTRACT

An optical multilayer structure has a substrate, a light-absorbing first layer in contact with the substrate, a gap portion having a changeable size capable of causing an optical interference phenomenon, and a second layer. By changing the size of the gap portion, an amount of reflection, transmission, or absorption of incident light can be changed. For example, the substrate is made of carbon (C), the first layer is made of tantalum (Ta), and the second layer is made of silicon nitride (Si_3N_4). Also in a visible light area, high response is realized. Consequently, the optical multilayer structure can be suitably used for an image display. The optical multilayer structure may be obtained by stacking, on a substrate made of a metal such as chromium (Cr), a first transparent layer made of a material having a high refractive index such as TiO_2 ($n = 2.40$), a second transparent layer made of a material having a low refractive index such as MgF_2 ($n = 1.38$), a gap portion having a changeable size capable of causing an optical interference phenomenon, and a third transparent layer made of a material having a high refractive index such as TiO_2 .